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**SKIN TREATMENT COMPOSITION**

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(56) Prior Art Documents  
**EP 182756**  
**AU 14659/88**  
**US 4303676**

(57) Claim

1. A composition for topical application to mammalian skin which comprises:

(i) from 0.01 to 99% by weight of hyaluronic acid fragments comprising from 7 to 50 monosaccharide units terminating either with a glucuronic acid unit and/or an N-acetyl glucosamine unit, or an unsaturated derivative of one or both of these terminal units; and

(ii) from 1 to 99.99% by weight of a cosmetically acceptable vehicle;

(iii) means for enhancing the activity of said fragments, in terms of angiogenic response, following topical application of the composition to the skin, said means being a penetration enhancer chosen from:

2-methyl propan-2-ol

Propan-2-ol

Ethyl-2-hydroxypropanoate

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Hexan-2,5-diol

POE(2) ethyl ether

Di(2-hydroxypropyl) ether

Pentan-2,4-diol

Acetone

POE(2) methyl ether

2-hydroxypropionic acid

2-hydroxyoctanoic acid

Propan-1-ol

1,4 Dioxane

Tetrahydrofuran

Propylene glycol dipelargonate

Polyoxypropylene 15 stearyl ether

Octyl alcohol

POE ester of oleyl alcohol

Oleyl alcohol

Lauryl alcohol

Dioctyl adipate

Dicapryl adipate

Diisopropyl adipate

Diisopropyl sebacate

Dibutyl sebacate

Diethyl sebacate

Dimethyl sebacate

Dioctyl sebacate

Dibutyl suberate

Dioctyl azelate

Dibenzyl sebacate

Dibutyl phthalate

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Dibutyl azelate

Ethyl myristate

Dimethyl azelate

Butyl myristate

Dibutyl succinate

Didecyl phthalate

Decyl oleate

Ethyl caproate

Ethyl salicylate

Isopropyl palmitate

Ethyl laurate

2-ethyl-hexyl pelargonate

Isopropyl isostearate

Butyl laurate

Benzyl benzoate

Butyl benzoate

Hexyl laurate

Ethyl caprate

Ethyl caprylate

Butyl stearate

Benzyl salicylate

2-hydroxypropanoic acid

2-hydroxyoctanoic acid

1-dodecylaza cycloheptan-2-one

dibutyl sebacate, and

esters of pyroglutamic acid having the structure (10)

as herein defined; and/or

a cationic polymer; and/or

a hair growth stimulant chosen from:

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- (1)  $\alpha$ -1,4 esterified disaccharides having the structure (2) as hereinbefore defined;
- (ii) esterified oligosaccharides including at least one esterified disaccharide unit consisting of a uronic acid residue having the structure (3) as hereinbefore defined and a hexosamine residue having the structure (4) as hereinbefore defined;
- (iii) minoxidil and derivatives thereof;
- (iv) direct proteoglycanase inhibitors;
- (v) glycosaminoglycanase inhibitors;
- (vi) glycosaminoglycan chain cellular uptake inhibitors;
- (vii) glycosidase inhibitors; and
- (viii) chemical activators of protein kinase C enzymes.